**Save the Bay**



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|  | **Save Casco Bay from an Oil Spill!**  1. To demonstrate what happens in an oil spill, fill a glass bottle two-thirds full of water. Add blue food coloring to make the "ocean."  2. Pour 1/2-inch or more of cooking oil into the bottle. This is the "oil spill."  Where does the oil congregate? (It floats on the surface)  What happens to an object (a cork) that you drop into the bottle? (It becomes coated with oil)  3. Put on the cap and shake the bottle vigorously (like storm or wave action). What happens to the oil? (Some of it mixes with the water)  4. Ask what would happen to organisms that float on the surface (sea birds, ducks, seaweeds, planktonic animals) or that need to come to the surface to breathe (whales, seals, sea turtles). (They'd be coated with oil.)  5. Explain that over time the water and oil mix somewhat and that some of the oil (which is heavier than this cooking oil) will sink to the bottom of the ocean.  What would happen to flounders, sea urchins, lobsters, crabs, and other bottom dwellers?  6. Students have to try to clean up an oil spill before it pollutes the ocean, animals, and shoreline.  7. To a large pan of water with a sandy shoreline (mound of sand at one end), add cooking oil to simulate a spill.  8. Let each team of three to four students choose two or three different clean-up materials to test.  9. Have students make a plan for how they will use each material, then test it.  10. Discuss why their efforts worked or didn't work.  Was all the oil removed?  How well might their methods work on an actual spill?  Discuss what kinds of equipment actual oil spill clean-up personnel use (such as oil containment booms, skimmers, dispersants, oil absorbing materials, etc.) and how similar they are to items the students used.  11. Make a diagram or list of the life in a marine environment near you. How would each organism be affected by an oil spill?  What animals are most vulnerable to an oil spill? (Those that can't move; filter feeders like oysters, barnacles, and clams; those that surface often; those that depend exclusively on marine life for their food supply.)  12. What can we as consumers do to mitigate oil spills? (Drive less, lower thermostats, use alternative forms of energy, use fewer oil-based products, demand, and be willing to pay for, safer transport mechanisms like double-hulled tankers.)  **Storm Waves**  Repeat this procedure but apply wave action by blowing "wind" across the surface of the water through a straw or with an electric fan. Discuss how the weather affects clean-up efforts.  **Oil Spill Contingency Plans**  Find out how your area is prepared to deal with oil spills. Find out what materials would be used and under what ocean conditions. Research what has been learned in the wake of the Exxon Valdez spill.  **Birds and Oil**  Examine a bird feather. Oiliness on the feather keeps the feathers from becoming waterlogged. Notice how it can fluff up after it's handled.  Drop the feather into a pan of clean water. Does it float? Shake it off.  Allow it to dry completely. Does it still fluff up?  Drop a bird feather into the pan of water and oil. What happens to it?  Try to clean it up. Some students may use liquid detergent; others may just scrub with a toothbrush.  Allow the feather to dry naturally, or dry it with a hair dryer. Does it still fluff up?  Drop it into a pan of water. Does it still float as well as it did before?  These tests indicate that the feather has lost its ability to insulate, and to resist water.  **Sea Otters and Oil**  Read *Spill! the Story of the Exxon Valdez*, Terry Carr, Franklin Watts, NY (1991) and *Sea Otter Rescue*, Roland Smith, Cobblehill Books, New York, (1990) which is the story of how sea otters were rescued, cleaned and returned to the wild after the Alaska *Exxon Valdez* oil spill in 1989.  Discuss the implications for marine mammals on our coast, especially harbor seals.  Find other resources about the *Exxon Valdez* spill and its consequences on the environment.  **Tracking Oil Spills**  After the *Exxon Valdez* oil spill, people realized the importance of tracking large oil spills, possibly by satellite imagery, to figure out where they were moving. Using imagery from the radar range of the electromagetic spectrum, scientists have developed a means for tracking the spill. Take a look at a sample image from [NASA](http://www.jpl.nasa.gov/sircxsar/oilsk.html) and a series of images from the [Tromsø Satellite Station](http://www.tss.no/oilserv/exa.html), Norway's national receiving station. Discuss with your students what measures they would use to track oil spills and why it is important. |

**Materials**

cooking oil mixed with black tempura paint, one or more glasses or clear plastic pans of water tinted with blue food coloring, sand, gravel, wide-mouthed glass bottle with cap, water, a cork or toy boat.

Materials to use for cleanup-cotton balls, straw/hay, cut-up panty hose, paper towels, popcorn, sponges, sawdust, sand, bandage pads, drinking straws, rope/string, turkey basters or eye droppers, popsicle sticks, liquid dishwashing detergent diluted in spray bottle.